

## **REMARKS**

The present Amendment and Response is intended to be fully responsive to all points of objections and/or rejections being raised by the Examiner and is believed to place the application in condition for allowance. Favorable reconsideration and allowance of the application are respectfully requested.

Applicants assert that the present invention is new, non-obvious and useful. Prompt reconsideration and allowance of the claims are respectfully requested.

### **Status of the Claims**

Claims 1-3 and 6-19 are pending in the application, of which:

Claims 1, 8, and 13 have been amended without prejudice. Applicants respectfully submit that the amendments to the claims do not add new matters.

Claims 2-3, 6, 10, 12, 15, and 17-18 were previously presented.

### **Remarks to Claim Rejections**

#### ***Claim Rejections - 35 USC §102***

In the Office Action, the Examiner rejected claims 8-11, 13-16, and 19 under 35 U.S.C. §102(b), as being anticipated by Wang et al. (Journal of Material Science: Materials in Electronics 6 (1995) 311-324). For example, the Examiner alleges that Wang et al. teaches forming a digital alloy on a substrate of “a silicon-on-insulator (SOI) structure of a SiGe-on-insulator (SGOI) structure”. Here, Applicants assume that the Examiner intended to say “a silicon-on-insulator (SOI) structure or a SiGe-on-insulator (SGOI) structure” because “a silicon-on-insulator (SOI) structure of a SiGe-on-insulator (SGOI) structure” does not have defined physical meaning.

Applicants have amended independent claims 8 and 13 to include a limitation that the substrate, whereon a layer of SiGe is formed, is a SiGe-on-insulator (SGOI) structure.

Applicants respectfully submit that amended claims 8 and 13 include distinctive elements such as, for example, a substrate of “a SiGe-on-insulator (SGOI) structure” that

are not taught, suggested, or implied by the prior art references of record. In the Office Action, the Examiner alleges that Wang et al. teaches forming a digital alloy on a substrate of a SiGe-on-insulator (SGOI) structure. Applicants respectfully disagree. In fact, Applicants have found the Examiner's allegation to be false and have found no evidence throughout the reference of Wang et al., including the paragraph bridging columns 1 and 2 of page 322 as pointed out by the Examiner, that may support the Examiner's contention of Wang et al. disclosing a digital alloy formed on a SiGe-on-insulator (SGOI) substrate.

In case that the Examiner still contends that a heterostructure substrate (described at the lower left paragraph of page 321 by Wang et al.) of a relaxed SiGe buffer layer formed on a SOI substrate is an SGOI substrate, Applicants would like to point out that this heterostructure (SiGe/Si/insulator/substrate) substrate shall not be confused with a SGOI (SiGe/insulator/substrate) substrate and a SiGe-on-insulator (SGOI) substrate is both structurally and functionally different from a silicon-on-insulator (SOI) substrate. Aside from the obvious structural difference that a SiGe layer is formed directly on top of an insulating layer with no intervening Si layer, it is well understood by those skilled in the art that a SGOI substrate may be engineered to have arbitrary in-plane lattice parameters (from Si to Ge) to optimize the growth and band offsets in a digital alloy. A SGOI substrate may also have significantly different defect structures in that strain-relieving dislocations are terminated at the buried insulator layer as it abuts the SiGe layer from below. This is in contrast to the heterostructure substrate described by Wang et al. in that dislocations at the lower portion of a SiGe layer in a heterostructure substrate are free to glide at the SiGe/Si interface and so may short adjacent devices. Also, in a heterostructure substrate the underlying Si layer (thin SOI) would be electrically parasitic, making it more difficult to activate dopants in Si, and the high temperatures required to do so would diffuse the digital alloy into a random alloy.

In view of above, Applicants respectfully submit that the amended independent claims 8 and 13 include distinctive elements that are not anticipated by Wang et al. and other prior art references of record, alone or in combination, and therefore are patentable.

Claims 9-11 depend from claim 8 and claims 14-16 and 19 depend from claim 13.

Claims 9-11 and claims 14-16 and 19 include the distinctive elements of claims 8 and 13, respectively, in addition to other distinct features. Therefore, claims 9-11, 14-16, and 19 are patentable for at least the reasons as described above with regard to claims 8 and 13.

In view of the above remarks, Applicants respectfully request that rejections of claims 8-11, 13-16, and 19 under 35 U.S.C. §102(b) be withdrawn.

### ***Claim Rejections - 35 USC §103***

In the Office Action, the Examiner rejected claims 1 and 3 under 35 U.S.C. §103(a) as being unpatentable over Churchill et al. (Semicond. Sci. Technol. 6 (1991) 18-26) in view of Wang et al.; rejected claim 2 under 35 U.S.C. §103(a) as being unpatentable over Churchill et al. in view of Wang et al. and further in view of Werner et al. (U.S. 2004/0140531); rejected claim 6 under 35 U.S.C. §103(a) as being unpatentable over Churchill et al. in view of Wang et al. and further in view of Lee et al. (U.S. 5,665,631); rejected claim 7 under 35 U.S.C. §103(a) as being unpatentable over Churchill et al. in view of Wang et al. and further in view of Fukuda et al. (U.S. 2004/0004271); rejected claims 12 and 17 under 35 U.S.C. §103(a) as being unpatentable over Wang et al. in view of Fukuda et al.; and rejected claim 18 under 35 U.S.C. §103(a) as being unpatentable over Wang et al. in view of Werner et al..

Applicants have amended independent claim 1 to include a limitation that the substrate, whereon a layer of SiGe is formed, is a SiGe-on-insulator (SGOI) structure.

Applicants respectfully submit that amended claim 1 includes distinctive elements such as, for example, a substrate of “a SiGe-on-insulator (SGOI) structure” that are not taught, suggested, or even implied by the prior art references of record. In the Office Action, the Examiner acknowledges that Churchill et al. fails to teach that the substrate is a silicon-on-insulator (SOI) structure or a SiGe-on-insulator (SGOI) structure. Applicants respectfully submit that Wang et al., and all other prior art references, fails to cure the deficiency of Churchill et al. by teaching a digital alloy forming on a SiGe-on-insulator (SGOI) substrate, as specifically required by amended claim 1, for the same reasons as described above with regard to claims 8 and 13.

In view of above, Applicants respectfully submit that amended claim 1 includes

distinctive elements that are not obvious over Churchill et al., Wang et al., and all other prior art references of record, alone or in combination, and therefore is patentable.

Claims 2-3 and 6-7 depend from claim 1, claim 12 depends from claim 8, and claim 17-18 depend from claim 13. Claims 2-3, 6-7, 12, and 17-18 include, respectively, all the distinctive elements of claims 1, 8, and 13, in addition to other distinct elements and/or features. Therefore, claims 2-3, 6-7, 12, and 17-18 are patentable for at least the reasons as described above with regard to independent claims 1, 8, and 13.

In view of the above remarks, Applicants respectfully request that rejections of claims 1-3, 6-7, 12, and 17-18 under 35 U.S.C. §103(a) be withdrawn.

### **Conclusion**

In view of the preceding remarks, Applicants respectfully submit that all pending claims are now in condition for allowance. Favorable reconsideration and allowance of the claims are respectfully requested.

No fees are believed to be due in connection with this paper. However, if there is any such fee due, please charge any such fee to the deposit account No. 09-0458.

Respectfully submitted,



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